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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,713	01/06/2004	Daniel C. Edelstein	FIS920030255US1	1712

32074 7590 11/04/2004

INTERNATIONAL BUSINESS MACHINES CORPORATION
DEPT. 18G
BLDG. 300-482
2070 ROUTE 52
HOPEWELL JUNCTION, NY 12533

EXAMINER
WILLIAMS, ALEXANDER O

ART UNIT	PAPER NUMBER
2826	

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/707,713	EDELSTEIN ET AL.	
	Examiner	Art Unit	
	Alexander O Williams	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *17-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/6 and 2/2/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Serial Number: 10/707713 Attorney's Docket #: FIS920030255US1
Filing Date: 1/6/2004;

Applicant: Edelstein et al.

Examiner: Alexander Williams

Applicant's election of Group I (claims 1 to 16), filed 8/19/04, has been acknowledged.

This application contains claims 17 to 31 drawn to an invention non-elected without traverse.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the semiconductor wafer comprising: a substrate; **a plurality of integrated circuits** fabricated on said substrate; **a dicing channel disposed between adjacent ones of said integrated circuits**, said channel exposing sidewalls of said integrated circuits; a layer of first dielectric material disposed on a top surface and sidewalls of said integrated circuits; and at least one layer of at least one second dielectric material disposed on said layer of first dielectric material, wherein said first dielectric material, in claim 1 and said

conductors are S-shaped or spring shaped or jogged in claim 14 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claims 1 to 16 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it is unclear and confusing to what is meant by and what shows "a semiconductor wafer comprising: a substrate; **a plurality of integrated circuits** fabricated on said substrate; **a dicing channel disposed between adjacent ones of said integrated circuits**, said channel exposing sidewalls of said integrated circuits; a

layer of first dielectric material disposed on a top surface and sidewalls of said integrated circuits; and at least one layer of at least one second dielectric material disposed on said layer of first dielectric material." Figures 1 and 2 show only one integrated circuit. Where is the dicing channel?

In claim 14, it is unclear and confusing to what is meant and what shows "said conductors are S-shaped or spring shaped or jogged."

Any of claims 1 to 16 not specifically addressed above are rejected as being dependent on one or more of the claims which have been specifically objected to above.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 to 8 and 10 to 12, **insofar as they can be understood**, are rejected under 35 U.S.C. § 102(b) as being anticipated by Yerman (U.S. Patent # 4,017,340).
1. Yerman (figures 1 and 2) specifically figure 1 show a semiconductor wafer **10**comprising: a substrate **38**; a plurality of integrated circuits **12** fabricated on said substrate; a dicing channel **(side of 12)** disposed between adjacent ones of said integrated circuits, said channel exposing sidewalls of said integrated circuits; a layer of first dielectric material **46,36** disposed on a top surface and sidewalls of said integrated circuits; and at least one layer of at least one second dielectric material **48,49** disposed on said layer of first dielectric material, wherein said first dielectric material has a Gc value of at least about 10 times greater than said second dielectric material (inherit since the same material are used).
2. The semiconductor wafer of Claim 1, Yerman show wherein said first dielectric material has a Gc value greater than about 0.1 kj/m2 (inherit since the same material are used).
3. The semiconductor wafer of Claim 1, Yerman show wherein said first dielectric material has a Gc value of about 0.5 to about c 2.5 kj/m2 (inherit since the same material are used).
4. The semiconductor wafer of Claim 1, Yerman show wherein said second dielectric material has a Gc value less than about c 0.05 kj/mz (inherit since the same material are used).
5. The semiconductor wafer of Claim 1, Yerman show wherein said second dielectric material has a G value of about 0.005 to c about 0.05 kJ/m2 (inherit since the same material are used).
6. The semiconductor wafer of Claim 1, Yerman show wherein said first dielectric material has a tensile strength of about 20 to 100 Mpa (inherit since the same material are used).
7. The semiconductor wafer of Claim 1, Yerman show wherein said second dielectric material has a tensile strength of about 700 to 10, 000 M Pa (inherit since the same material are used).

As to claims 2 to 8, Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

8. The semiconductor wafer of Claim 1, Yerman show wherein said first dielectric material is selected from the group consisting of polyesters, phenolics, **polyimides**, polysulfones, polyether ether ketones, polyurethanes, epoxies, polyarylene ethers, and polyethylene terepthalates.

10. The semiconductor wafer of Claim 1, Yerman show wherein said second dielectric material is selected from the group consisting of SiNX, SiOz, SiC, TEOS, FTEOS, **FSG**, and **OSG**.

11. The semiconductor wafer of Claim 1, Yerman show wherein said second dielectric material is SiO2.

12. The semiconductor wafer of Claim 1, Yerman show wherein said dicing channel exposes sidewalls of said integrated circuits and sidewalls of said substrate.

Initially, it is noted that the 35 U.S.C. § 103 rejection based on a plurality of layers deals with an issue (i.e., the integration of multiple pieces into one piece or conversely, using multiple pieces in replacing a single piece) that has been previously decided by the courts.

In Howard v. Detroit Stove Works 150 U.S. 164 (1893), the Court held, "it involves no invention to cast in one piece an article which has formerly been cast in two pieces and put together...."

In In re Larson 144 USPQ 347 (CCPA 1965), the term "integral" did not define over a multi-piece structure secured as a single unit. More importantly, the court went further and stated, "we are inclined to agree with the solicitor that the use of a one-piece construction instead of the [multi-piece] structure disclosed in Tuttle et al. would be merely a matter of obvious engineering choice" (bracketed material added). The court cited In re Fridolph for support.

In re Fridolph 135 USPQ 319 (CCPA 1962) deals with submitted affidavits relating to this issue. The underlying issue in In re Fridolph was related to the end result of making a multi-piece structure into a one-piece structure. Generally, favorable patentable weight was accorded if the one-piece structure yielded results not expected from the modification of the two-piece structure into a single piece structure.

Therefore, it would have been obvious to one of ordinary skill in the art to use the plurality of layera as "merely a matter of obvious engineering choice" as set forth in the above case law.

Claims 13 to 16, **insofar as they can be understood**, are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yerman (U.S. Patent # 4,017,340).

13. The semiconductor wafer of Claim 1, Yerman further comprising a plurality of conductors embedded in said first dielectric material and said second dielectric material and in contact with said plurality of integrated circuits.

14. The semiconductor wafer of Claim 13, Yerman show wherein said conductors are S-shaped or spring shaped or jogged (Same as so far as Applicant's show).

15. The semiconductor wafer of Claim 1, Yerman show wherein said semiconductor wafer comprises a plurality of layers of said at least one second dielectric material.

Therefore, it would have been obvious to one of ordinary skill in the art to use the plurality of layers as "merely a matter of obvious engineering choice" as set forth in the above case law.

Claims 9, **insofar as they can be understood**, are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yerman (U.S. Patent # 4,017,340) in view of Sun et al. (U.S. Patent Application Publication # 2003/0222330 A1).

Yerman show the features of the claimed invention as detail above, but fail to explicitly show wherein said first dielectric material is a polyarylene ether.

Sun et al. is cited for show a passivation processing over a memory link. Specifically, Sun et al. (figures 1 to 11C) specifically figure 3C discloses a dielectric

material is a polyarylene ether **46** for the purpose of preventing defects resulting from alignment variations of subsurface layers or patterns contaminated.

Therefore, it would have been obvious to one of ordinary skill in the art to use Sun et al.'s polyarylene ether dielectric material to modify Yerman's dielectric material for the purpose of preventing defects resulting from alignment variations of subsurface layers or patterns contaminated.

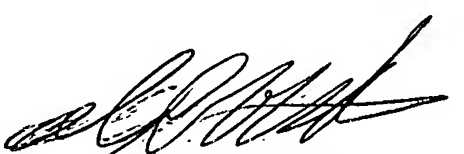
The listed references are cited as of interest to this application, but not applied at this time.

Field of Search	Date
U.S. Class and subclass: 257/788,789,790,787,758,700,701,620	11/1/04
Other Documentation: foreign patents and literature in 257/788,789,790,787,758,700,701,620	11/1/04
Electronic data base(s): U.S. Patents EAST	11/1/04

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander O Williams whose telephone number is (571) 272 1924. The examiner can normally be reached on M-F 6:30-7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272 1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alexander O Williams
Primary Examiner
Art Unit 2826

AOW
11/1/04